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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor	: Steven Bathiche et al.	
Appln. No.:	09/251,519	
Filed	: February 17, 1999	Group Art Unit: 2675
For	: TWO-HANDED COMPUTER INPUT DEVICE WITH ORIENTED SENSOR	Examiner: S. Kumar
Docket No.:	M61.12-0101	

BRIEF FOR APPELLANT

Commissioner for Patents
Washington, D.C. 20231

Sir:

This communication is an appeal from an Advisory Action mailed on March 12, 2002, in which all of the pending claims 1-20 and 22-23 stand finally rejected.

REAL PARTY INTEREST

Microsoft Corporation, a corporation organized under the laws of the state of Washington, and having offices at One Microsoft Way, Redmond, Washington 98052, has acquired the entire right, title and interest in and to the invention, the application, and any and all patents to be obtained therefor, as set forth in the Assignment filed with the patent application and recorded on Reel 010056, frame 0039.

RELATED APPEALS AND INTERFERENCES

There are no known related appeals or interferences which will directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

STATUS OF THE CLAIMS

Claims 1-20 and 22-23 are pending in the application. Claims 1-12, 16-20 and 22-23 stand rejected under 35 U.S.C. 103(a)

as being unpatentable over Barnes et al. (U.S. Pat. No. 6,069,594) in view of Beasley et al. (U.S. Pat. No. 5,721,842) and further in view of Jacobs et al. (U.S. Pat. No. 5,059,958). Furthermore, claims 13-15 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Barnes et al. in view of Beasley et al.

Claim 21 has been cancelled. The rejection of pending claims 1-20 and 22-23 is hereby appealed.

STATUS OF AMENDMENTS

There are no outstanding amendments.

SUMMARY OF INVENTION

The present invention generally relates to a computer input device. In particular, the present invention relates to a computer input device having an orientation sensor disposed thereon.

Various embodiments of the present invention utilize the computer input device 14, generally described on page 5, line 27 to page 7, line 12. Fig. 1 illustrates an exemplary computer input device 14 for use with embodiments of the present invention. Input device 14 includes one or more orientation sensors arranged to sense the physical orientation of the computer input device 14 in space. Furthermore, the computer input device 14 includes rotatable wheel 24, multiple switch input device 26, shift button 28, mode switch button 30, one or more auxiliary buttons 32 and one or more triggers (Fig. 3A). The input device further includes an upper housing portion with two depending handles 17 and 19.

As schematically illustrated in Fig. 4, the computer input device 14 also includes a controller 106. Operation of controller 106 and the input device 14 is described on page 14, line 9 to page 19, line 30. Controller 106 is configured to receive signals from X and Y axis tilt sensors and circuitry 108, button array 112, zone calibration circuit 114 and wheel encoder circuit 116 through elements disposed on computer input device 14.

Furthermore, controller 106 outputs a mode indicator 118. Controller 106 also is configured to assemble data packet 122 in order to be sent to computer 20.

Various aspects of the present invention include a method of generating a data packet indicative of user operation of the computer input device 14. An exemplary data packet 122 is illustrated in Fig. 5 and described on page 19, line 31 to page 22, line 3. The method is illustrated in Fig. 6 and includes steps described from p. 22, line 4 to page 26, line 31. Information indicative of a physical orientation of the input device is received at step 124. In addition, information indicative of a multiple switch device or a rotatable member is received at 126. Further, the orientation data and at least one of the multiple switch device information or rotatable member information is assembled into a data packet at either 134 or 146. Another aspect of the invention includes a data structure generated as described above.

Through use of computer device 14, a number of different modes may be used, if desired. These modes may be used to control a visual display 16. In one mode, orientation information is used to control display 16 and in another mode multiple switch information is used to control the display 16. Data packet 122 alternatively may be assembled in such a way that an application is not required to know what mode the computer input device 14 is operating in. The application can simply examine the X and Y tilt information fields and use the information accordingly. This feature saves programmers time in developing applications that utilize input device 14.

DESCRIPTION OF REFERENCES RELIED ON BY THE EXAMINER

Barnes et al. (U.S. Pat. No. 6,069,594).

Barnes et al. describe a computer input device 30 that includes microphones 31, 32 and 33 for receiving acoustic signals

from a reference frame 20. The input device 30 provides positional information in a Cartesian coordinate system as well as rotation about the X, Y and Z axes. Keys 36 are provided that operate independent of each other.

Beasley et al. (U.S. Pat. No. 5,721,842).

Beasley et al. describes a computerized switching system for coupling a work station to a remotely located computer. A data packet can send keyboard and mouse commands through the computerized switching system to a remote computer. Generally, the packet passes through a 32x32 switch box in order to control a remote computer.

Jacobs et al. (U.S. Pat. No. 5,059,958).

Jacobs et al. describe a tilt sensitive control box. The box in Jacobs is configured such that tilting the box in different directions causes actuation of switches within the box. Two independent buttons are placed on the box.

ISSUES

Whether claims 1-12, 16-20 and 22-23 are obvious under 35 U.S.C. 103 over Barnes et al. in view of Beasley et al. and further in view of Jacobs et al. Furthermore, whether claims 13-15 are obvious under 35 U.S.C. 103 over Barnes et al. in view of Beasley et al.

GROUPING OF CLAIMS

The following groupings of claims are made solely in the interest of consolidating issues and expediting this Appeal. No grouping of claims is intended to be nor should be interpreted as being any form of admission or a statement as to the scope or obviousness of any limitation.

Group I : Claims 1-2, 7-9;

Group II : Claims 3, 5-6, 10;

Group III : Claims 4, 11-12;

Group IV : Claims 13-14;

Group V : Claim 15;
Group VI : Claim 16;
Group VII : Claims 17-19;
Group VIII: Claim 20;
Group IX : Claim 22;
Group X : Claim 23.

ARGUMENT

Rejection of Group I Claims

Claims 1-2 and 7-9 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Barnes et al. in view of Beasley et al. and further in view of Jacobs et al. Appellant submits that this combination fails to render the Group I claims obvious.

Claim 1 is an independent claim and recites a method of preparing a data packet indicative of operator manipulation of a handheld computer input device. The method includes receiving information indicative of a physical orientation of the computer input device. Furthermore, information indicative of a configuration of a multiple switch device located on the computer input device and having at least two different degrees of motional freedom is received. Movement of the multiple switch device in the different degrees of motional freedom causes actuation of different switches in the multiple switch device. Furthermore, the method includes placing data in an orientation field and a multiple switch field in the data packet.

1. No Prima Facie Case of Obviousness-There is no Motivation or Suggestion to Combine the References.

In order to establish a prima facie case of obviousness, three basic criteria must be established by the Examiner. First, there must be some suggestion or motivation to combine the references. Next, there must be a reasonable

expectation of success. Further, the prior art references must teach or suggest all the claim limitations. See MPEP 2142.

It is fundamental that rejections under 35 U.S.C. 103 be based on evidence comprehended by the language of that section. In re Grasselli, 713 F.2d 731, 739, 218 USPQ 769, 775 (Fed. Cir. 1983). The factual inquiry of whether to combine references must be thorough and searching. Id. It must be based on objective evidence of record. In re Lee, 61 USPQ 2d. 1430 (Fed. Cir. 2002). A thorough analysis of the evidence of record prevents an analysis wherein the combination merely uses what the inventor has taught against the inventor. Id. Particular findings must be made as to the reason the skilled artist, with no knowledge of the claimed invention, would have selected these components for combination in the matter claimed. In re Kotzab, 217 F. 3d. 1365, 1371, 55 USPQ 2d. 1313, 1317 (Fed. Cir. 2000). Conclusory statements themselves are not evidence. Id. Appellant submits that the evidence of record provided in the various Office Actions is insufficient to establish an obviousness rejection. The Examiner has made broad conclusory statements not supported by the cited references. The rejections are inappropriately derived from what the present inventors have taught.

The latest Office Action on page 2 reported that Beasley et al. disclose "placing data in an orientation field and a multiple switch field in the data packet." However, this is simply not true. Beasley et al. discloses a computing network switch, not a switch or a computer input device. Appellant notes that the description of Beasley et al. does not even contain the words "orientation" or "multiple switch". The cited sections in the Office Action (col. 2 to col. 3, l. 17; col. 5, ll. 30-42; col. 6, ll. 43-57) merely describe packaging some type of data to be sent through the switching system. The sections do not refer to an orientation field or a multiple switch field or to assembling a

packet having these fields. The mere fact that Beasley et al. package keyboard or mouse data does not provide a teaching of these fields in a packet. Accordingly, it is difficult to ascertain the evidence supporting a combination of Barnes et al. and Beasley et al.

In the latest Office Action, the Examiner further reported that, "it would have been obvious to one of ordinary skill in the art to incorporate the data packet feature of Beasley et al. into the system of Barnes et al." The only statement provided for the motivation is, "the data packet feature is advantageous as it allows easy disbursement of information to several locations." This is merely a conclusory remark and does not provide any evidence as to why one of ordinary skill in the art would choose to use Barnes et al. with the networking switch described by Beasley et al.

Granted, the data packet feature of Beasley et al. may allow easy disbursement of information to several locations. However, Barnes et al. do not describe any motivation or suggestion for combining the outputs of its pointer device 30 into a data packet for disbursement to multiple locations. Therefore, no one would need to combine Barnes et al. with Beasley et al., and Barnes et al. does not suggest such a combination.

In addition, Beasley et al. does not suggest the combination. Beasley et al. merely mention that keyboard and mouse signals can be placed in a data packet, but do not mention assembling orientation information and multiple switch information into a single data packet. Thus, it appears that the motivation provided by the Examiner is not supported by the evidence of record.

On page 3 of the latest Office Action, the Examiner provides that the features of Jacobs et al. teach moving a multiple switch device in different degrees of freedom to actuate

different switches in the multiple switch device. The Examiner further stated that the features of Jacobs et al. are advantageous because "it provides faster reaction time, better operating reliability, lower production cost, and enhanced human factors." Likewise, this statement appears to be merely conclusory and not supported by the evidence of record. The section of Jacobs et al. referred to by the Examiner (col. 2, ll. 20-29) is made with respect to all prior art of Jacobs et al., which does not include either Barnes et al. or Beasley et al. The Examiner merely concludes these advantages without stating why or how these specific advantages would be attained. Further, this section is contrary to what is described on page 3, line 20 to page 4, line 2 of Applicant's Specification. In part, Applicant describes, "the configuration of the Jacobs et al. device can provide ergonomically deficient hand position resulting in fatigue or discomfort." It appears that the Examiner has ignored this section.

Additionally, the Office Action establishes no motivation or suggestion for dependent claims 2 and 7-9 or those dependent claims described below. Without evidence of suggestion or motivation for the claims, an obviousness rejection cannot be maintained.

2. No Motivation or Suggestion to Combine Orientation Sensing and A Multiple Switch Device.

Even if the cited references are used, the combination fails to teach or suggest motivation to pick those features of the references that result in the present invention when viewed as a whole. Barnes et al. describe an input device that senses orientation of the input device. As correctly noted in the Office Action, Barnes et al. fail to disclose movement of a multiple switch device in different degrees of motional freedom that causes

actuation of different switches in the multiple switch device. Beasley et al. describe a networking switch for a computer network for coupling a work station to a remotely located computer. Using the switch, keyboard and mouse commands are able to be sent to other computers in the network. A packet is used, but the packet does not include an orientation field or a multiple switch field. Jacobs et al. teach a control box that responds to orientation of the control box. When the control box is tilted in a certain direction, (i.e. affecting the orientation of the control box) an output of the orientation is sent to the computer based on sensors in the box (col. 6., ll. 40-47). Thus, the "multiple switch device" in Beasley et al., as suggested by the Examiner, is actually an orientation sensor.

Given that fact, the prior art cannot provide any motivation or suggestion to combine an orientation sensor and a multiple switch device, wherein movement of the multiple switch device in multiple degrees of motional freedom causes actuation of different switches in the multiple switch device. The proposed combination must at least suggest the desirability of the claimed invention. See MPEP 2143.01. As noted above, both Barnes et al. and Jacobs et al. teach orientation sensors. Thus, putting the device of Jacobs et al. in the device of Barnes et al. would merely sense orientation, and not provide information indicative of an orientation sensor and a multiple switch device. Even though Jacobs et al. disclose a switch configuration, that switch configuration simply measures orientation (i.e. tilting) of the control box. This type of sensing is just what is done in Barnes et al. Thus, combining these references would lead to multiple orientation sensors for a single input device, which is undesirable, or at least unnecessary.

In addition, combining these references would provide slower reaction time and a higher production cost (not faster

reaction times and lower production costs as alleged by the Examiner). Using a networking switch as described in Beasley et al. with Barnes et al. and Jacobs et al. would significantly decrease the reaction time and increase the cost of an input device. Furthermore, Jacobs et al. teach a box with a lower production cost since it is "constructed with minimum parts to optimize reliability and reduce manufacturing cost." (col. 2, ll. 52-53). Adding intricate parts of Barnes et al. including reference frame 20 and three microphones 31, 32 and 33 would not reduce manufacturing cost. Similarly, as discussed in the previous paragraph, combining Barnes et al. with Jacobs et al. would result in having duplicate orientation sensors, which would certainly not lower production cost.

3. No Teaching or Suggestion of All Claim Limitations.

Ultimately, however, as can be gleaned from the above two sections, the combination of these prior art references simply does not teach or suggest both an orientation sensor and a multiple switch device as recited in claim 1 of the present invention. In an obviousness determination, all claim limitations must be taught or suggested by the prior art. Thus, the cited combination must provide both an orientation sensor and a multiple switch device. The Office Action cites sections of Barnes et al. that describe sensing orientation of the input device, pressing keys and orientation of the keys. None of these references teach or suggest a packet that include an orientation field and a multiple switch field. Likewise, none of these references include orientation sensors and a multiple switch device, wherein movement of the multiple switch device causes actuation of different switches in the multiple switch device.

Beasley et al. do not teach or suggest a data packet

including an orientation field and a multiple switch field. The packets utilized by Beasley et al. are illustrated in Figs. 2A and 2B and described at col. 2, ll. 42-56. Generally, the packets include a start value, a size value, a command value, data and error checking values. Other values pertaining to the destination and sender are also used. No mention whatsoever is made of utilizing an orientation field and a multiple switch field.

Accordingly, Appellants submit that the rejection of Group I claims is not supported by the cited references. The Examiner has failed to establish a prima facie case of obviousness and the references themselves provide no teaching or suggestion of the claimed invention. As a result, Appellants request reversal of the rejection of the Group I claims.

Rejection of Group II Claims

Claims 3, 5-6 and 10 relate to placing data in the orientation field based on first and second selected modes. In particular, claim 3 recites placing orientation data indicative of the physical orientation of the computer device in the orientation field when the selected mode is a first selected mode. Claim 3 also recites placing predetermined orientation data in the orientation field when the selected mode is a second selected mode. The predetermined orientation data corresponds to the configuration of the multiple switch device. Thus, in one mode the orientation sensor data is used to populate the orientation field and in the other mode, the multiple switch device data is used to populate the orientation field.

The Office Action refers to col. 8, ll. 37-62 of Barnes et al. to teach the features of claim 3. Barnes et al. describe a "2D" operating mode and a "6D" operating mode. The 2D operating mode operates as a conventional mouse while the 6D mode permits six degrees of freedom of the mouse. Appellants note that the 6D

mode provides three dimension positional information and also attitude information indicative of orientation information. However, orientation sensor data in Barnes et al. does not teach placing a data field in one mode and placing predetermined orientation data corresponding to the configuration of a multiple switch device in the data field, when in the second selected mode.

On page 2 of the Office Action, the Examiner asserted that the configuration of a multiple switch device is the actuation of keys 36 (referring to mouse buttons). In the rejection of claim 3, it appears that the Examiner is asserting that the configuration providing predetermined orientation information is the orientation of the keys 36, namely when in the 2D mode, the keys 36 are on a flat desktop and the predetermined orientation information is indicative of the orientation of the input device on a flat plane.

Using the Examiner's rejection, the orientation of device 30 and the orientation of keys 36 (i.e., the denoted configuration in the Office Action) provide the same information to computer 200, which is contrary to the claim language in claim 30. Accordingly, reversal of the rejection of the Group II claims is requested.

Rejection of Group III Claims

Claims 4 and 11-12 also relate to placement of information in the packet based on a selected mode. Claim 4 recites selecting a predetermined orientation value from a plurality of predetermined orientation values based on the configuration of the multiple switch device. Claim 11 recites orientation information is replaced with a predetermined value based on the switch information.

As asserted in the Office Action, Barnes et al., when operating in the 6D mode, provide orientation information to the computer. When operating in the 2D mode, orientation information is not necessary since the mouse operates on a desktop. On page 4, the Office Action cited col. 9, ll. 16-60 of Barnes et al. to disclose "there are predetermined orientation angles for the pitch, roll and yaw." However, these orientation angles are not based on the configuration of the multiple switch device.

This is apparently acknowledged by the Examiner. On page 2 of the Office Action, the Examiner reported that the configuration is related to actuation of keys 36 and not orientation of the computer input device 30.

However, on page 4 of the Office Action the Examiner is equating the configuration of the multiple switch device to be an orientation angle corresponding to the pitch, roll and yaw of the computer input device 30. Appellants submit that interpretations of the configuration of the device to mean both actuation of mouse buttons and orientation of the input device are conflicting.

In sum, the Examiner has not pointed to any teaching or suggestion that the predetermined orientation angles are based on the multiple switch configuration, the rejection of Group III claims cannot be maintained, and Appellants submit that these claims are allowable.

Rejection of Group IV Claims

In another aspect of the present invention as set out in claims 13 and 14, a method of preparing a data packet includes receiving rotation information indicative of rotation of a rotatable member on the computer input device. Furthermore, the method includes receiving orientation information indicative of a physical orientation of the computer input device and placing data in an orientation field and a rotation field in the data packet

based on the orientation information and the rotation information. An exemplary rotatable member is shown as wheel 24 in Fig. 1.

The Examiner has rejected claim 13 based upon the section of Barnes et al. providing orientation information to a computer and Figs. 6A-6D, which illustrate the orientation of the computer input device 30. As a result, the Examiner has recited the same feature twice (i.e. orientation information from the summary and orientation of the device in Figs. 6A-6D) to show both an orientation sensor and receiving information indicative of a rotating member on the computer input device.

As recited in claim 13, the computer input device provides rotation information and orientation information. From the claim, it is clear that this information is not the same information. Further, Barnes et al. do not teach or suggest a rotatable member on the input device that provides rotation information other than rotation of the input device itself. Certainly the input device itself rotates, but again, this merely provides the orientation information. Accordingly, the rejection provided by the Examiner simply does not meet the claim limitations. Thus, claim 13 is believed to be allowable.

Rejection of Group V Claim

Claim 15 recites a method and depends from claims 13 and 14. The method further includes receiving button information indicative of depression of a plurality of buttons on the computer input device and placing data in a button field in the data packet based on the button information. On page 6 of the Office Action, the Examiner referred to col. 6, ll. 29-38 of Barnes et al. to teach the step of receiving button information. However, the same section is used to teach the step of receiving switch information recited in claim 14. Thus, it appears that the same elements are used to describe separate features recited in

the claims. Claim 15 requires the use of both multiple switch information and button information. Accordingly, rejection of this claim is improper and reversal of the rejection is requested.

Rejection of Group VI Claims

Claim 16 recites a data structure generated by a computer input device for transmission to a computer. The data structure includes an orientation field which contains orientation data indicative of a physical orientation of the computer input device. Furthermore, the data structure includes a switch field containing switch information indicative of a multiple switch device located on the computer input device. The multiple switch device includes at least two different degrees of motional freedom wherein movement of the multiple switch device in the different degrees of motional freedom causes actuation of different switches in the multiple switch device. An exemplary data structure is illustrated in Fig. 5.

On page 3 of the Office Action, claim 16 was rejected under the same rationale as claim 1. For reasons above, Appellants submit that there is simply no teaching or motivation to provide the data structure as recited in claim 16. The combination has various deficiencies as previously described.

Also, including both an orientation field and a multiple switch field in one data structure is simply not provided. The data packets illustrated in Figs. 2A and 2B of Beasley et al. do not include fields indicative of orientation information and switch information. Thus, claim 16 is believed to be independently allowable.

Rejection of Group VII Claims

Claims 17-19 depend from claim 16 and further include a rotation field, a button field and a mode field, respectively.

With respect to these claims, the rotation and button fields recited are rejected based on duplicates of portions cited in Barnes et al. For example, both the button field and the multiple switch field are rejected based on the same section. Further, no evidence has been provided that describes a separate mode field. The only mode indication in Barnes et al. occurs when the input device is flat on a desktop plane, and is then an indication of the orientation. This does not constitute a separate mode field containing mode data. Accordingly, reversal of this rejection is requested.

Rejection of Group VIII Claim

In yet another embodiment, claim 20 recites a computer input device that includes a first housing portion including at least one user actuable input device and first and second extending handles coupled to and extending away from the first housing portion. The computer input device further includes an orientation sensor coupled to the first housing portion. The orientation sensor senses a physical orientation of the first housing portion and further provides an orientation signal indicative thereof. A controller is coupled to the orientation signal and receives the orientation signal and places data in an orientation field based on the orientation signal in a data packet. Also, a multiple switch device has at least two different degrees of motional freedom and actuable by an operator of the input device. Movement of the multiple switch device in different degrees of motional freedom causes actuation of different switches in the multiple switch device. The controller is further configured to receive switch information indicative of a configuration of the multiple switch device and to place switch data in a multiple switch field in the data packet based on the switch information.

Appellant submits there is no teaching or suggestion for the computer input device recited in claim 20. The combination of Barnes et al., Beasley et al. and Jacobs et al. simply fails to teach or suggest the features of the computer input device. As mentioned earlier, there is simply no teaching or suggestion to combine the keys of Barnes et al. with the orientation sensor of Jacobs et al. The combined computer input device would include two orientation sensors, which is unnecessary. Further, there is no teaching or suggestion to combine these features in a device having two extending modules. Accordingly, the rejection of claim 20 should be reversed.

Rejection of Group IX Claim

Claim 22 depends from claim 20 and further recites a mode selector actuable by an operator. The controller is further configured to receive mode information indicative of a selected mode of a plurality of selected modes of operation. Data is placed in the orientation field and the multiple switch field based on the selected mode.

Barnes et al. describe modes depending on whether the computer input device lies in a desktop plane (col. 8, ll. 39-42). The 2D mode provides information in two dimensions while the 6D mode operates in a Cartesian coordinate system. The Office Action refers to the rejections of claims 1 and 13 to reject claim 20. Appellant respectfully submits that the rejection should be based on claims 1 and 3. Appellant notes that the 2D mode and 6D modes do not refer to placing data in the orientation field and the multiple switch field based on the selected mode. As much as Barnes et al. describe, the data provided from the keys are not altered based on the 2D or 6D mode. The keys 36 operate independently of the mode. Nor is there any teaching or suggestion of the limitations in claim 22 in combination with those found in

claim 20. Thus, this rejection is improper and reversal is requested.

Rejection of Group X Claim

A further aspect of the present invention is recited in claim 23 and includes a method of controlling a visual display on a computer display device based on an input from a computer input device. The method includes receiving orientation information indicative of the physical orientation of the computer input device. Furthermore, switch information is received that is indicative of a configuration of a multiple switch device located on the computer input device. The multiple switch device has at least two different degrees of motional freedom and movement of the multiple switch device in the different degrees of motional freedom causes actuation of different switches in the multiple switch device. Additionally, mode information is received that is indicative of a selected mode of operation. Furthermore, the method includes controlling the display device such that an object being displayed on the visual display device assumes a visual orientation corresponding to one of the physical orientation of the computer input device as indicated by the orientation information and the configuration of the multiple switch device as indicated by the switch information. The visual orientation is based on the selected mode.

Claim 23 recites features similar to claim 1 and other dependent claims. As mentioned earlier, the cited combination of references fail to teach or suggest these features. In addition, claim 23 recites controlling visual orientation of a display based on the selected mode. Appellant submits that the orientation of a visual display is not based on the keys of Barnes et al. The keys of Barnes et al. operate as mouse buttons and do not orient the

visual display based on the 2D mode or 6D mode. Accordingly, reversal of this rejection is requested.

CONCLUSION

The cited combination of references fails to teach or suggest the features recited in the pending claims. Also, there is no motivation to combine the cited references. Furthermore, the Examiner has not established a prima facie case of obviousness based on evidence of record. As a result, claims 1-20 and 22-23 are believed to be allowable. Reversal of the rejection to all claims is requested.

Respectfully submitted,

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Appendix A

1. A method of preparing a data packet indicative of operator manipulation of a hand held computer input device, the method comprising:

receiving information indicative of a physical orientation of the computer input device;

receiving information indicative of a configuration of a multiple-switch device located on the computer input device and having at least two different degrees of motional freedom wherein movement of the multiple-switch device in the different degrees of motional freedom causes actuation of different switches in the multiple-switch device; and

placing data in an orientation field and a multiple-switch field in the data packet.

2. The method of claim 1 and further comprising:

receiving information indicative of a selected mode of a plurality of selectable modes of operation; and

placing the data in the orientation field and the multiple-switch field in the data packet based on the selected mode.

3. The method of claim 2 wherein the step of placing the data comprises:

placing orientation data indicative of the physical orientation of the computer input device in the orientation field when the selected mode is a first selected mode; and

placing predetermined orientation data in the orientation field when the selected mode is a second selected mode, the predetermined orientation data corresponding to the configuration of the multiple-switch device.

4. The method of claim 3 wherein placing predetermined orientation data comprises:

selecting a predetermined orientation value from a plurality of predetermined orientation values based on the configuration of the multiple-switch device.

5. The method of claim 3 wherein placing the data further comprises:

placing predetermined switch configuration data in the multiple-switch field when the selected mode is the second selected mode.

6. The method of claim 5 wherein the predetermined switch configuration data corresponds to depression of no switches in

the multiple-switch device.

7. The method of claim 2 wherein the step of placing the data in the orientation field and the multiple switch field in the data packet based on the selected mode is performed on the computer input device.

8. The method of claim 2 wherein the computer input device is coupled to a computer and wherein the step of placing the data in the orientation field and the multiple switch field in the data packet based on the selected mode is performed on the computer.

9. The method of claim 8 wherein the computer includes an input device driver and wherein the step of placing the data in the orientation field and the multiple switch field in the data packet based on the selected mode is performed on the computer by the input device driver.

10. The method of claim 1 wherein the step of placing the data in the orientation field and the multiple switch field in the data packet based on the selected mode is performed on the computer by the input device driver by:

receiving an input device data packet comprising an orientation field including orientation information indicative of the physical orientation of the computer

input device, a multiple-switch field including switch information indicative of the configuration of the multiple-switch device and a mode field including mode information indicative of the selected mode; and

maintaining the orientation information in the orientation field and the switch information in the multiple-switch field when the selected mode is a first selected mode.

11. The method of claim 10 wherein the step of placing the data in the orientation field and the multiple switch field in the data packet based on the selected mode is performed on the computer by the input device driver by:

replacing the orientation information in the orientation field with a predetermined orientation value, based on the switch information, when the selected mode is a second selected mode.

12. The method of claim 11 wherein the step of placing the data in the orientation field and the multiple switch field in the data packet based on the selected mode is performed on the computer by the input device driver by:

replacing the switch information in the multiple-switch field with a predetermined value when the selected mode is the second selected mode.

13. A method of preparing a data packet indicative of operator manipulation of a hand held computer input device, the method comprising:

receiving orientation information indicative of a physical orientation of the computer input device;

receiving rotation information indicative of rotation of a rotatable member on the computer input device; and

placing data in an orientation field and a rotation field in the data packet based on the orientation information and the rotation information.

14. The method of claim 13 and further comprising

receiving switch information indicative of a configuration of a multiple-switch device on the computer input device; and

placing data in a multiple-switch field in the data packet based on the switch information.

15. The method of claim 14 and further comprising

receiving button information indicative of depression of a plurality of buttons on the computer input device; and

placing data in a button field in the data packet based on the button information.

16. A data structure generated by a computer input device for

transmission to a computer, comprising:

an orientation field containing orientation data indicative of a pitch and roll physical orientation of the computer input device; and

a switch field containing switch information indicative of a multiple-switch device located on the computer input device and having at least two different degrees of motional freedom wherein movement of the multiple-switch device in the different degrees of motional freedom causes actuation of different switches in the multiple-switch device.

17. The data structure of claim 16 and further comprising:

a rotation field containing rotation information indicative of rotation of a rotatable member on the computer input device.

18. The data structure of claim 17 and further comprising:

a button field containing button information indicative of depression of buttons on the user input device.

19. The data structure of claim 18 and further comprising:

a mode field containing mode information indicative of a state of a mode selector on the computer input device.

20. A computer input device, comprising:

a first housing portion including at least one user actuable input device;

a first extending handle, coupled to and extending away from, the first housing portion;

a second extending handle, coupled to and extending from the first housing portion;

an orientation sensor coupled to the first housing portion and sensing a physical orientation of the first housing portion and providing an orientation signal indicative thereof;

a controller coupled to the orientation sensor and configured to receive the orientation signal and place data in an orientation field, based on the orientation signal, in a data packet;

a multiple-switch device having at least two different degrees of motional freedom and actuable by an operator such that movement of the multiple switch device in the different degrees of motional freedom causes actuation of different switches in the multiple-switch device, the controller being configured to receive switch information indicative of a configuration of the multiple-switch device and to place switch data in a multiple-switch field in the data packet based on the switch information.

22. The computer input device of claim 20 and further comprising:

a mode selector, actuable by an operator, the controller being configured to receive mode information indicative of a selected mode of a plurality of selectable modes of operation and to place the data in the orientation field and the multiple-switch field in the data packet based on the selected mode.

23. A method of controlling a visual display on a computer display device based on an input from a computer input device, the method comprising:

receiving orientation information indicative of a physical orientation of the computer input device;

receiving switch information indicative of a configuration of a multiple-switch device located on the computer input device and having at least two different degrees of motional freedom wherein movement of the multiple-switch device in the different degrees of motional freedom causes actuation of different switches in the multiple-switch device;

receiving mode information indicative of a selected mode of operation; and

controlling the display device such that an object being displayed on the visual display device assumes a visual orientation corresponding to one of, the physical orientation of the computer input device as indicated by the orientation information and the configuration of the multiple-switch device as indicated by the switch information, based on the selected mode.

Appendix B ****

Barnes et al. (U.S. Pat. No. 6,069,594)

Beasley et al. (U.S. Pat. No. 5,721,842)

Jacobs et al. (U.S. Pat. No. 5,059,958).

Appendix C ****

In re Grasselli, 713 F.2d 731, 739, 218 USPQ 769, 775 (Fed. Cir. 1983).

In re Lee, 61 USPQ 2d. 1430 (Fed. Cir. 2002).

In re Kotzab, 217 F. 3d. 1365, 1371, 55 USPQ 2d. 1313, 1317 (Fed. Cir. 2000).